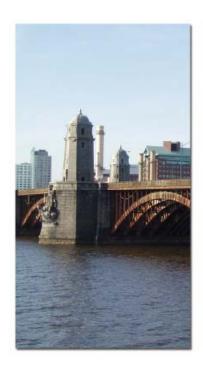


## Accelerated Bridge Program Craigies and BU Project Updates









January 27, 2009

Commonwealth of Massachusetts

Department of Conservation and Recreation



## Program Overview

- Authorization:
  - Chapter 233 of the Acts of 2008
- Program Goals:
  - Improve the Condition of the Commonwealth's Bridges
  - Stimulate Economic Development and Job Creation
  - Save Money by Completing Projects Sooner
  - Complete Projects Efficiently and Innovatively
  - Transparency and Accountability



## Program Overview

- Size and Scope
  - MassHighway: \$2.078 billion
    - rehabilitation or replacement of 191 bridges
    - preservation of 305 bridges
  - DCR: \$906 million
    - rehabilitation or replacement of 29 bridges
    - preservation of 50 bridges

Total Program: \$2,984,000,000



## Project Overview and Status – BU Bridge



- •Scheduled for advertisement in next three four weeks
- •\$27M estimate
- •Springtime start with a three year repair schedule in phases



## **BU Bridge History**

- Cottage Farm Bridge Built 1928
- Replaced 1850's drawbridge
- Located in Charles River Basin Historic District
- Eligible for listing National Register of Historic Places
- Renamed BU Bridge 1949





## **Project Goals**

- Restore Structural Integrity
- Restore a Historic Structure
- Protect & Enhance Environment
- Improve Pedestrian and Bicycle Access









## Restore Structural Integrity







## **BU Bridge Historic Restoration**





Restoration of fascia and architectural elements



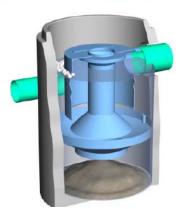
### BU Bridge Environmental Enhancements

Conversion of existing antiquated drainage to modern environmentally friendly recharge system

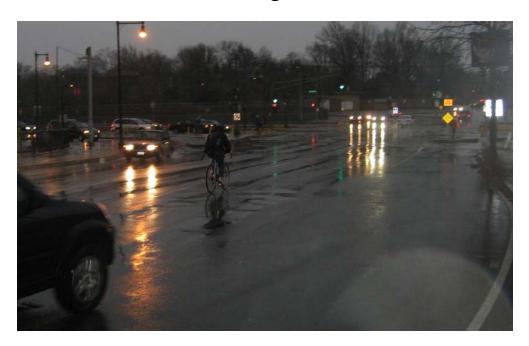








## dcr Safety and Pedestrian and Bicycle Access



DCR sought consultant expertise on pedestrian and bicycle access alternatives after receiving community input.





### Toole Design Group Scope

- Assessed Bike and Pedestrian Mobility During Construction Phases
- Made Recommendations on Final Design
- Developed
   Recommendations and
   Conceptual Plans for
   Rotary Redesign in
   Cambridge
- Developed
   Recommendations for
   Shared Use Path
   Crossing at Rotary

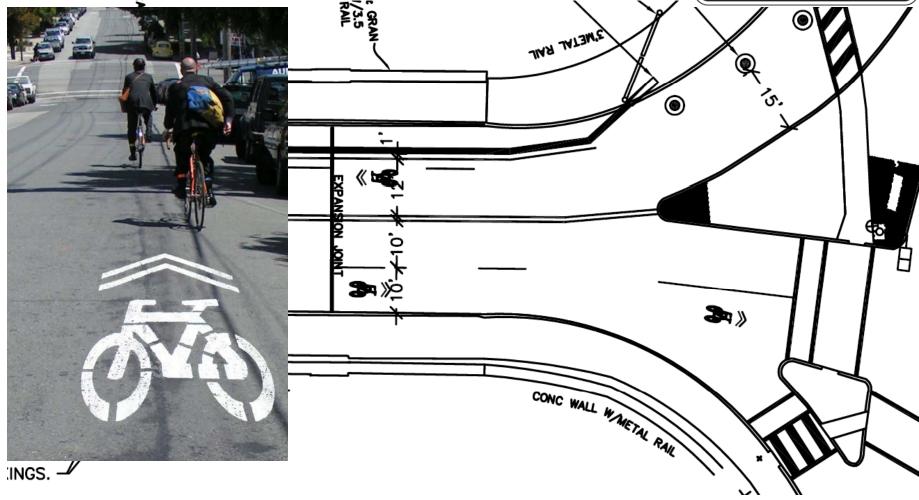




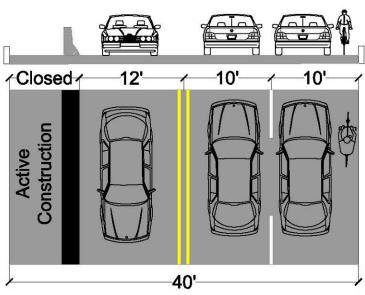
### **BU** Bridge

Recommended Bicycle Accommodations During Construction

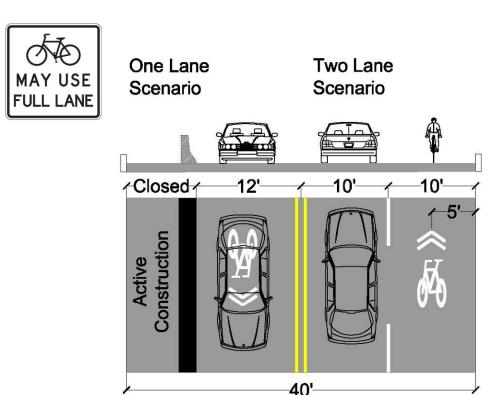




## dcr Shared Lane Marking Purpose



- Cyclists often ride close to curb when no guidance provided
- It is unsafe to pass cyclists within narrow travel lanes (less than 14 feet)

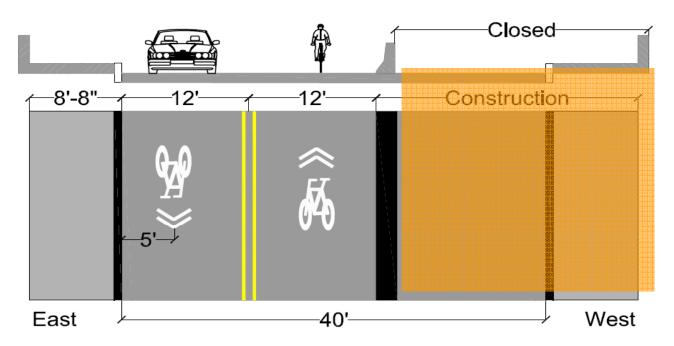


- Encourage cyclists to "take the lane" and ride safe distance from curb
- Encourage motorists to pass with care or drive behind cyclists 13

## dcr Phase 1 Construction



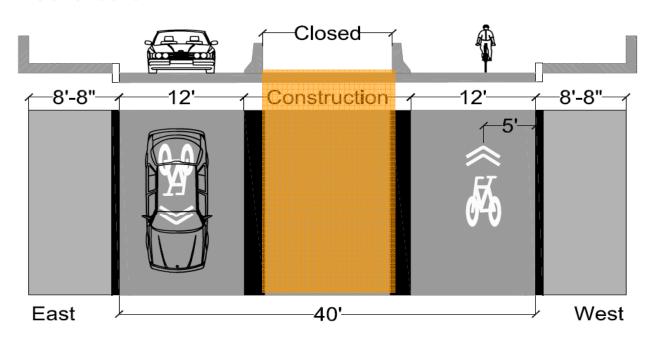
#### Phase 1 Construction



## dcr Phase 2 Construction



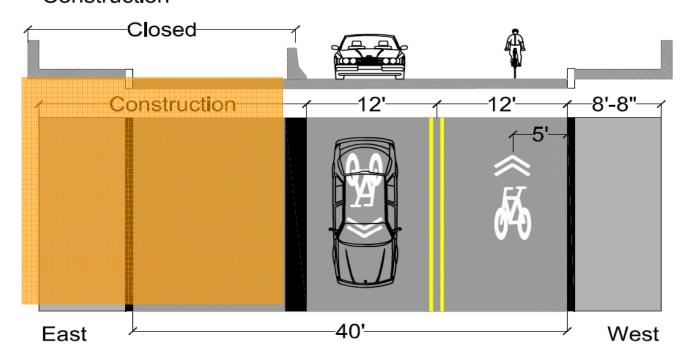
#### Phase 2 Construction



## dcr Phase 3 Construction



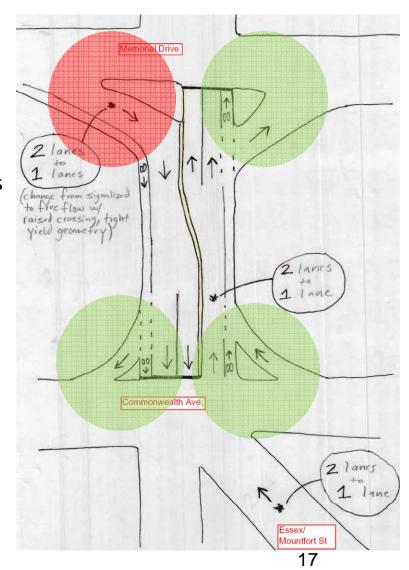
## Phase 3 Construction





## BU Bridge Bicycle Lane Feasibility

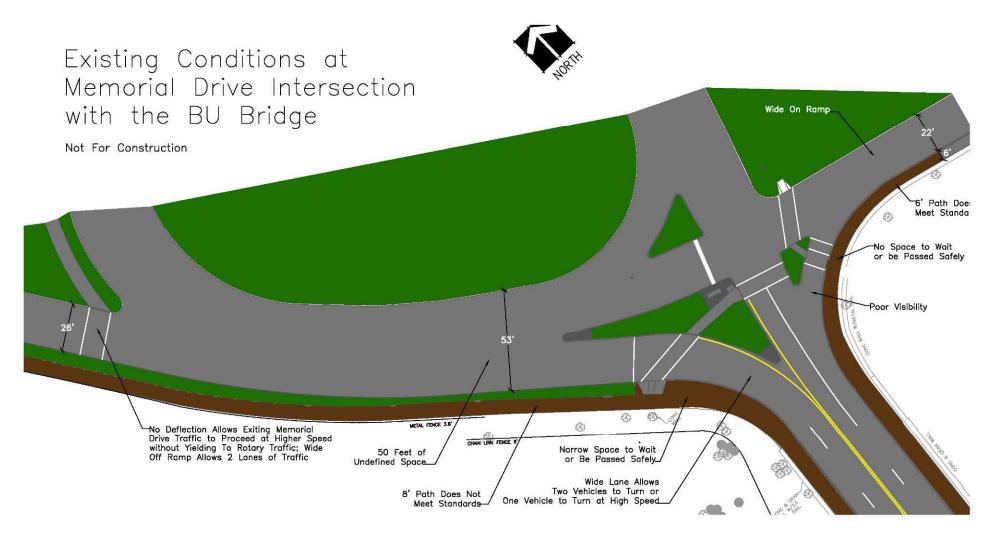
- Vehicle Capacity Analysis
  - Not a capacity issue for 3 approaches
  - Concern about capacity at Memorial Drive to BU Bridge southbound approach
- Slip Lane Concerns
  - Vehicle entrance speeds
  - Sight distance restrictions
- Rotary Concerns
  - No definition of space
  - Traffic isn't managed





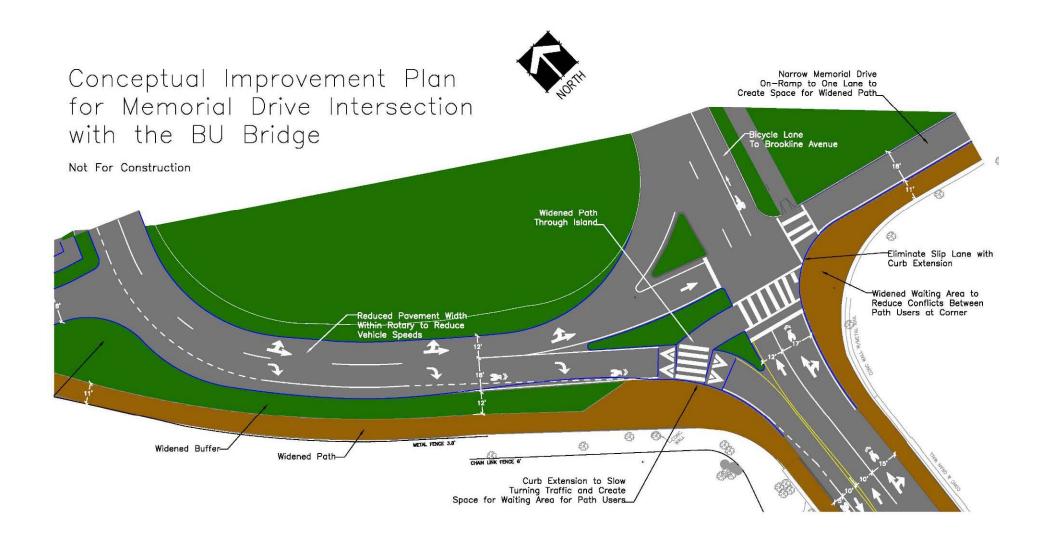


## Existing Memorial Drive at BU Bridge



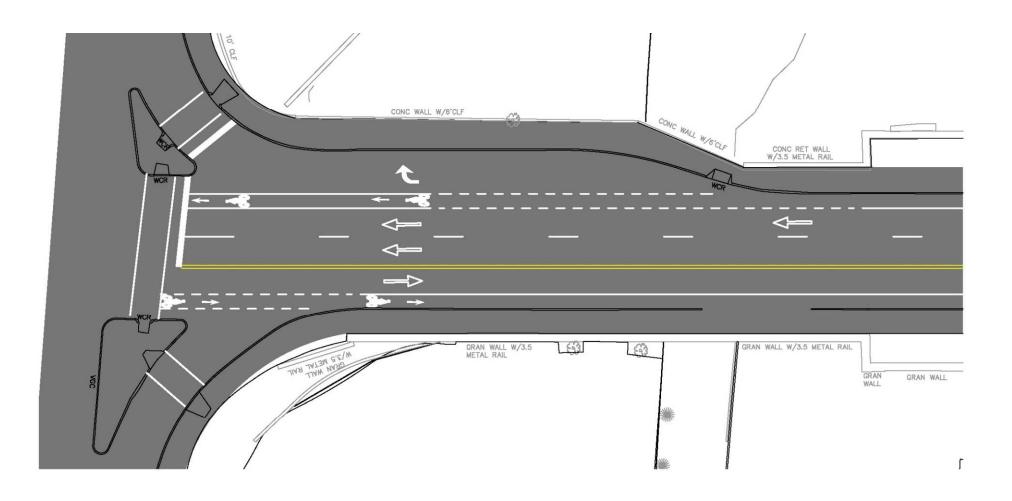


## Proposed BU Bridge at Memorial Drive





## BU Bridge at Commonwealth Avenue





## Q&A on BU Bridge



### Project Overview and Status – Craigie Bridges





- •Bundled project scheduled for advertisement in next three four weeks
- •\$53M total estimate
- •Springtime start with a three-year repair schedule in phases
- Much of the work is offsite fabrication



### Overall Project Goals

#### Craigie Drawbridge

 Provide a new twin double-leaf bascule bridge that provides reliable passage for mariners and improves vehicular and pedestrian traffic flow and conditions.

#### Craigie Dam Bridge

- Repair the dam bridge so that the new structural members can provide safe travel for vehicular and pedestrian traffic.
- Widen the existing pathway in front of the Museum of Science to provide better access for pedestrians and cyclists.
- Restore, in kind, the historic fence on the downstream wall of the Charles River Dam.



## Craigie Drawbridge History

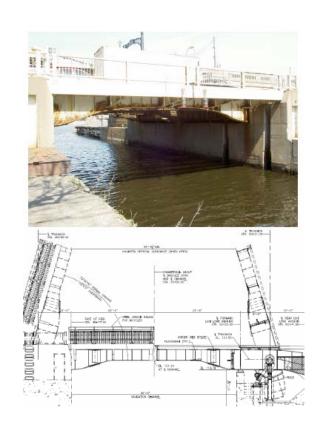
- Originally constructed in 1910 and replaced in 1962
- Twin Double-Leaf Bascule Bridge 45 ft. span over navigation channel
  - 3 "Boston Bound" traffic lanes
  - 2 "Cambridge Bound" traffic lanes
  - Sidewalks on each side
  - Abutted by the MBTA Green Line and the Museum of Science





## Craigie Drawbridge Project Scope

- Demolish the existing superstructure.
- Provide a temporary bridge structure to carry traffic.
- •Repair substructure and modify as required to accept new superstructure.
- •Install new superstructure and solid bridge deck, which will provide better weathering protection for machinery and comfort of vehicular and pedestrian traffic.
- •Replace all machinery components and electrical components.





## Craigie Dam Bridge History

- Constructed in 1906
- Used in conjunction with the drawbridge to control the Charles River water level prior to 1978.
- Consists of 9 sluice ways, one of which was a small boat lock.
- Supported on timber piles which are capped by a 2' thick concrete apron.





## Craigie Dam Bridge Scope

- Replace all damaged and deteriorated structural members.
- Remove temporary shoring that is currently in place.
- Reconstruct bridge deck at the curb line and the existing sidewalks.





# Toole Design Group Assessment of Craigie Bridge Restoration

- Ped/Bike Accommodations During Construction
- Ped/Bike Accommodations During Longfellow Bridge Detour (Interim Condition)
- Ped/Bike Accommodations After Longfellow Bridge Reconstruction

#### Assessed feasibility and viability of:

- Shared Use Path
- Shared Lanes
- Bicycle Lanes
- Wider Sidewalks



## Toole Design Group Scope

- Assessed Feasibility of Shared Use Path Along Museum
- Assessed Bike and Pedestrian Mobility During Construction Phases
- Developed Concept for Interim Design (Longfellow and Downstream Detours)
- Developed Concept for Potential Ultimate Design
- Assessed Pedestrian Accommodations Throughout



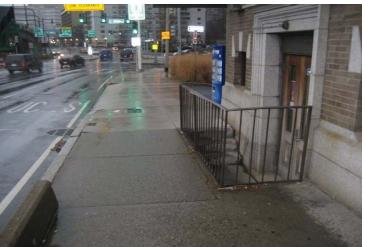
78' - 7 lar es 65' - 6 lanes 64' - 5 lanes 64' - 5 lanes

### dcr Shared Use Path Evaluation

Cyclist and pedestrians desire buffer space of approximately 2 feet to vertical objects or curb drops reducing the effective width









## Concluded Shared Use Path will be compromised by:

- Narrow "effective" width of <6
  feet too small for two way bike
  traffic</li>
- 4 driveway crossings
- Lots of conflicts with pedestrians

A path may be appropriate for one way bicycle traffic.

It will be necessary to provide on road accommodations during construction and after construction to provide maximum cyclist mobility and pedestrian comfort.



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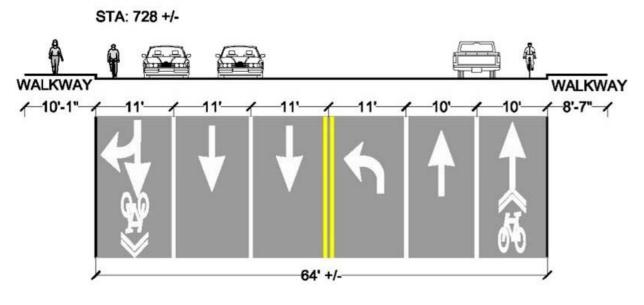
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## dcr 🚱

# Shared Lanes During Reconstruction

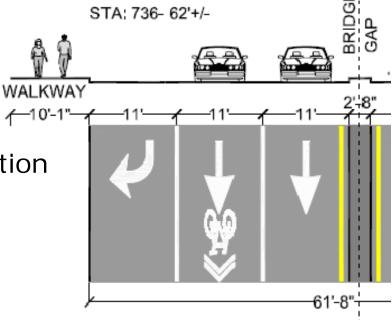






#### 

- Must provide 3 inbound Boston lanes
- Truck lanes require 11 foot minimum width
- Drawbridge walkway to curb width is 33 feet
- 10' walkway across drawbridge
- More flexibility on north side
  - Narrower travel lanes
  - Left turn lane reduction possibilities
- Unknown detour volumes into
   Boston during Longfellow Reconstruction



## dcr Interim Condition – Longfellow Detour

#### **Bike Lane To Cambridge:**

- Eliminate pedestrian refuge islands between Land Boulevard and Museum Way
- Maintain existing sidewalk widths along Museum property
- Reduce travel lane widths (including one Boston inbound lane restricting trucks from this 10 foot lane)

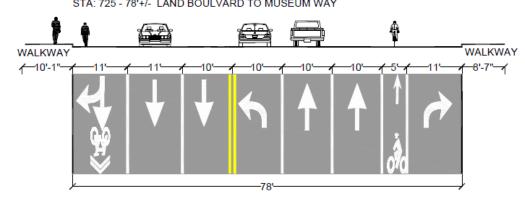
#### Or

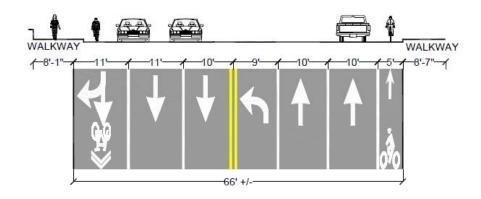
- Eliminate the left turns at Land Boulevard during interim period
- Accept congestion at Land Boulevard due to left turn queuing beyond Museum Way

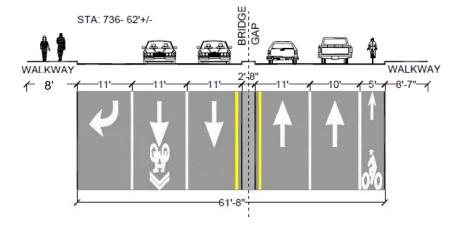
Options currently under review with Cities of Boston and Cambridge and will require additional traffic analysis.

#### Shared Lane and Path to Boston

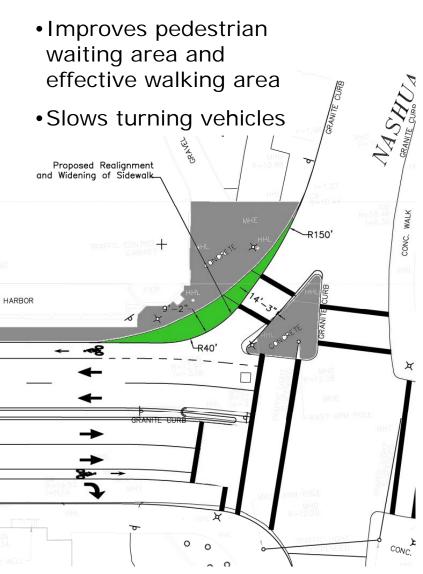
- Recommend one way bicycle riding on walkway to minimize conflicts
- Shared lane placed to encourage merging before right turn begins







## dcr Redesign of Slip Right Turn from Nashua Street







## dcr Redesign of Driveways





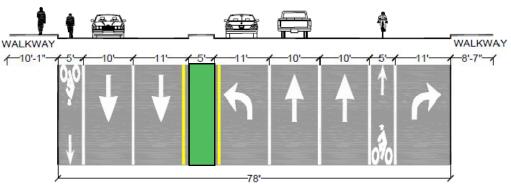
#### **ULTIMATE CONDITION**

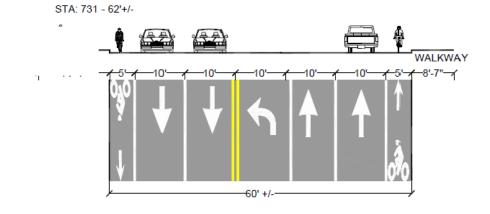


MAINTAIN SPLIT PHASE SIGNAL AT LAND BLVD. ALL DAY ELIMINATE TRAVEL LANE INTO BOSTON TO END OF LEFT TURN LANE INTO CAMBRIDGE

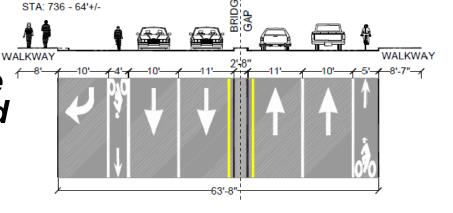
STA: 725 - 78'+/-

- Bicycle lanes in both directions improving cyclist comfort on road
- Reinstitutes island for traffic signal
- Potential for widening sidewalk along Museum frontage to Cambridge
- Existing sidewalk remains at 8 feet along Museum
- Requires further analysis of left turn vehicle movement to Museum and Land Boulevard





Interim project will not preclude future bike lanes or an improved shared use path system





#### Questions

More Information on DCR Bridge Projects:

Web: <a href="https://www.mass.gov/dcr/projects">www.mass.gov/dcr/projects</a>

Email: <u>dcr.updates@state.ma.us</u>

Phone: 617-626-4947

 More Information on Accelerated Bridge Program:

Web: <a href="https://www.mass.gov/acceleratedbridges">www.mass.gov/acceleratedbridges</a>